

Abstract

Subject: Evaluation of Toxicity of Thymoquinone, as A Bioactive Compound of Nigella Sativa Using Isolated Mitochondria from Different Organs

Introduction: Thymoquinone (TQ) is a bioactive compound in Nigella sativa (Ranunculaceae), There are various researches in the field of anti-cancer properties of this compound, because this compound has many anti-inflammatory and antioxidant properties. The sensitivity of mitochondria to drugs and other foreign compounds is one of the serious and important issues faced by people. Because such compounds can damage vital tissues and organs such as brain, liver, heart, kidney and muscles. Mitochondrial toxicity caused by compounds with medicinal potential is always one of the major concerns of the pharmaceutical industry. Because it can cause the removal of the medicine offered in the market. Target The upcoming study was designed based on the evaluation of the direct toxicity of thymoquinone compound as a natural compound with potential therapeutic effects on mitochondria isolated from rat liver.

Materials and methods: Mitochondria were isolated from fresh male rat's liver tissues using mechanical lysing and differential centrifugation techniques. Then, the isolated mitochondria were divided into the following groups: control and concentration of Thymoquinone (0, 50, 100, 500 μ M). The effects of Thymoquinone were assessed on a series of mitochondrial parameters including mitochondrial succinate dehydrogenases (SDH) activity, mitochondrial swelling, reactive oxygen species (ROS) formation, mitochondrial lipid peroxidation during 1 hour incubation with thymoquinone.

Result: Thymoquinone did not cause deleterious alterations in mitochondrial functions, mitochondrial swelling, SDH, lipid peroxidation, ROS formation and MMP in mitochondria isolated from liver. Altogether, the data of this study showed that Thymoquinone is not directly toxic in in mitochondria isolated from liver, and suggests that probably other pathways and metabolisms have role in the toxicity of this compound.

Key words: Thymoquinone Mitochondria, liver Toxicity, Nigella Sativa, Antioxidant